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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,421	08/15/2006	Masahide Miura	129097	9868
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FORREST, MICHAEL				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,421

Applicant(s)

MIURA, MASAHIRO

Examiner

MICHAEL FORREST

Art Unit

4162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/86)
Paper No(s)/Mail Date 8/15/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).
2. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.
3. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claim 1 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claim 1 of U.S. Patent No. 7,314,845 in view of Morikawa (US Patent Application Publication 2002/0049137). Both claims disclose a catalyst comprising Ce and Zr metal oxide particles, noble metal supported on the metal oxide particles, and where the inner core of the metal oxide particle differs in element content than the surface layer. There are two differences between the instant and reference claims: (1) the relative molar content of zirconia and ceria in the inner core and surface layer are reversed in the instant claim; (2) the instant claim discloses Rh as being carried by the metal oxide particles.

5. Morikawa teaches a catalyst comprised of Zr and Ce oxide particles where the inner core has larger amounts of ceria (see Example 20). Morikawa further teaches that agglomerated particles which are predominantly comprised of ceria in the inner core and zirconia in the outer core have enhanced activity in a fuel-lean ordinary period (see Para 0072 to 0074). It would have been obvious to one of ordinary skill in the art at the time of the invention to reverse the element content of the catalyst disclosed by the '845 patent to having higher zirconia on the surface as taught by Morikawa to improve the lean-burn activity.

6. Morikawa further teaches a catalyst where Rh is loaded on the agglomerated particles (see Para 0057). Morikawa further teaches that Rh is good in terms of reducing activity for purifying exhaust gas (see Para 0013). It would have been obvious to one of ordinary skill in the art at the time of the invention for the noble metal in the catalyst taught by the '845 patent to comprise Rh as taught by Morikawa to achieve good reducing activity.

7. Claim 7 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claim 15 of U.S. Patent No. 7,314,845 in view of Morikawa (US Patent

Application Publication 2002/0049137). Both claims teach a method of preparing metal oxide particles, the method comprising the steps of providing a suspension of metal oxides or hydroxides, adjusting the pH of the suspension to the isoelectric point of zirconia to form aggregates, and drying and firing the aggregates. The '845 patent does not teach separate aggregation steps to first form an inner core of ceria before depositing zirconia. Morikawa teaches a process for making aggregates comprising successive precipitation steps for each metal oxide formed (see Para 0119). Successive precipitation allows the earlier precipitated metal to act as nuclei for the metal oxides that follow to precipitate preferentially on the surface where the surface layer may act as a heat protective or stabilizing layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the aggregation method as taught by the '845 patent in successive steps as taught by Morikawa to produce aggregate particles with inner cores and protective surface layers.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites the limitation "the cerium constituting the ceria in the core part" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 1 further recites the limitation "the zirconium constituting the zirconia in the core part" in

line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 5-6 depend on Claim 1.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Morikawa(US Patent Application Publication 2002/0049137). Morikawa teaches a catalyst comprising a metal oxide secondary particle comprising an agglomeration of a plurality of primary particles (see Para 0047-0048). Morikawa further teaches a catalyst where the agglomeration has different distributions of metal element between the surface and inner portion (see Para 0049). Morikawa further teaches a catalyst wherein Rh is supported on the secondary particles (see Para 0057). Morikawa further teaches a secondary particle wherein CeO₂ is distributed more in the inner portion of the secondary particle and ZrO₂ is distributed more in the surface side of the secondary particle (see Para 0072 to Para 0074 and Example 20). All limitations of Claim 1 of the instant application are anticipated by Morikawa.
12. Regarding Claim 4, Morikawa further teaches a catalyst where the secondary particles have average particle diameters desirably 8µm or less (see Para 0052).

13. Regarding Claim 5, Morikawa further teaches a catalyst where the yttria is mixed with ceria (see Para 0072). Morikawa also teaches a catalyst where the agglomerated particles further involve an oxide of rare-earth elements other than Y (see Para 0075).

14. Regarding Claim 6, Morikawa further teaches a catalyst where yttria is mixed with the zirconia (see Para 0074). Morikawa also teaches a catalyst where the agglomerated particles further involve an oxide of rare-earth elements other than Y (see Para 0075).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa(US Patent Application Publication 2002/0049137). As applied to claim 1, Morikawa teaches a catalyst comprising a secondary particle agglomeration of ceria and zirconia primary particles where the ceria is distributed more in the inner portion of the agglomeration and the zirconia is distributed on the surface portion, and Rh is supported on the secondary particle. Morikawa further teaches preparation of a catalyst with given ranges for molar ratios between Ce, Zr, and other metal oxides (see Para 0156). When the range of molar fraction of Ce is calculated from these ratios, the range is equivalent 9 to 90 mol% to Ce and Zr. In a case where claimed ranges overlap or lie inside ranges disclosed by prior art a *prima facie* case of obviousness exists. Here the claimed range of 35 to 50 mol% lies within the range of the prior art, 9 to 90 mol%. It would

have been obvious to one of ordinary skill in the art at the time of the invention to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference. Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. See MPEP 2144.05.

17. Regarding Claim 3, Morikawa further teaches the preparation of a catalyst with given ranges for molar ratios between Ce, Zr, and other metal oxides in a sample catalyst (see Para 0156). When the range for total molar fraction of Ce and Zr is calculated from these ratios, the range is equivalent to 23 to 87 mol%. The claimed range overlaps with the prior art range. It would have been obvious to one of ordinary skill in the art at the time of the invention to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference.

18. In the alternative to overlapping in ranges with Morikawa, the following rejections are made for Claims 2-3:

19. Claims 2-3 are also rejected under 35 U.S.C 103(a) as being unpatentable over Morikawa (US Patent Application Publication 2002/0049137) in further view of Kuno (US Patent Application 2004/0087440). As applied to claim 1, Morikawa teaches a catalyst comprising a secondary particle agglomeration of ceria and zirconia primary particles where the ceria is distributed more in the inner portion of the agglomeration and the zirconia is distributed on the surface portion, and Rh is supported on the secondary particle. Morikawa teaches a molar fraction of Ce to the total of Ce and Zr in the range of 9 to 90% (see Para 0156). Morikawa does not specifically teach the range of 35 to 50mol%. Kuno specifically teaches that a molar ratio of 1:1 (50 mol%) is preferred (see Para 0014). Kuno further teaches that using about the same

amounts of Zr and Ce maintains the heat resistivity of the mixture (see Para 0034). It would have been obvious to one of ordinary skill in the art at the time of the invention to make a catalyst as taught by Morikawa with a Zr:Ce molar ratio of 1:1 as taught by Kuno to maintain heat resistivity of the catalyst.

20. Regarding claim 3, Kuno further teaches that the Zr/Ce oxide particles carry noble metal at an amount of 0.01 to 5wt% (see Para 0045).

21. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuno(US Patent Application Publication(2004) and further in view of Morikawa (US Patent Application Publication 2002/0049137). Kuno teaches a method of preparing metal oxide particles, the method comprising the steps of providing a suspension of metal oxides or hydroxides, adjusting the pH of the suspension to the isoelectric point of the metal oxide to form aggregates, and drying and firing the aggregates. Kuno does not teach separate aggregation steps to first form an inner core of ceria before depositing zirconia. Morikawa teaches a process for making aggregates comprising successive precipitation steps for each metal oxide formed (see Para 0119). Successive precipitation allows the earlier precipitated metal to act as nuclei for the metal oxides that follow to precipitate preferentially on the surface where the surface layer may act as a heat protective or stabilizing layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to perform the aggregation method as taught by Kuno in successive steps as taught by Morikawa to produce aggregate particles with inner cores and protective surface layers.

Conclusion

22. Claims 1-7 are pending. Claims 1-7 are rejected. No claims are allowed.
23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL FORREST whose telephone number is (571)270-5833. The examiner can normally be reached on Monday - Thursday, 9:00am - 4:00pm.
24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571)272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer McNeil
Supervisory Patent Examiner
Art Unit 4162

Michael Forrest
Patent Examiner
Art Unit 4162

/MF/

/Jennifer McNeil/
Supervisory Patent Examiner, Art Unit 4162